

Appl. No. 10/039,942
Amdt. dated September 26, 2005
Reply to Office action of July 25, 2005

Docket No. 47406-012500

PENDING CLAIMS

Claim 1 (previously presented): An assembly comprising:

an etched hole-fill stand-off, wherein the etched hole-fill stand-off comprises a copper clad laminate having a dielectric layer laminated between a first and a second copper layer wherein the at least one hole of the stand-off is etched through the first copper layer but not through either the dielectric layer or second copper layer;

a tooling plate contacting the etched hole-fill stand-off, the stand-off and tooling plate being aligned to each other;

a device having holes to be filled removably contacting the stand-off, the stand-off and device being aligned to each other; and

the device and the stand-off each having at least one hole, the at least one hole of the device being aligned with the at least one hole of the stand-off.

Claim 2 (original): The assembly of claim 1 wherein hole of the stand-off is larger in diameter than the hole of the device.

Claim 3 (original): The assembly of claim 1 wherein the device comprises a plurality of holes to be filled and the stand-off comprises a plurality of holes wherein each hole to be filled of the device is aligned with a hole of the stand-off.

Claim 4 (original): The assembly of claim 1 wherein the stand-off comprises an external copper layer and the device comprises an external copper layer, the layer of the stand-off being in direct contact with the layer of the device.

Claim 5 (previously presented): The assembly of claim 4, wherein the at least one hole of the stand-off extends only through the external copper layer of the stand-off.

Claim 6 (original): The assembly of claim 1 wherein a first set of pins aligns the stand-off to the tooling plate and a second set of pins aligns the device to the stand-off.

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Claim 7 (original): The assembly of claim 6 wherein the stand-off rests on but is not bonded to tooling-plate other than by the pins aligning the stand-off and the tooling plate, and the device rests on but is not bonded to the stand-off other than by the pins aligning the stand-off and the device.

Claim 8 (original): The assembly of claim 1 wherein at least one hole of the device is filled with a fill material that extends partially into a hole of the stand-off without contacting the stand-off.

Claim 9 (previously presented): An assembly comprising an etched hole-fill stand-off, the stand-off comprising an etched layer bonded to a non-etched layer; wherein the etched hole-fill stand-off comprises a copper clad laminate having a dielectric layer laminated between a first and a second copper layer wherein the at least one hole of the stand-off is etched through the first copper layer but not through either the dielectric layer or second copper layer.

Claim 10 (canceled)

Claim 11 (original): The assembly of claim 9 further comprising:

a tooling plate contacting the non-etched layer of the etched hole-fill stand-off, the stand-off and tooling plate being aligned to each other;

a device having holes to be filled removably contacting the etched layer of the stand-off, the stand-off and device being aligned to each other; and

the device and the stand-off each having at least one hole, the hole of the device being aligned with the hole of the stand-off, the hole of the stand-off having a larger diameter than the hole of the device.

Claim 12 (previously presented): A method of filling holes in a substrate having a plurality of holes to be filled, comprising:

providing an etched hole-fill stand-off, the stand-off comprising a copper clad laminate having a dielectric layer laminated between a first and a second copper layer wherein at least one hole of the stand-off is aligned with at least one hole of the substrate to be filled, the at least one

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hole of the stand-off being etched through the first copper layer, but not through either the dielectric layer or second copper layer;

aligning the stand-off to a tooling plate by overlaying the stand-off on the tooling plate;

aligning the substrate to the stand-off and placing the substrate in contact with the stand-off; and

filling the plurality of holes of the substrate.

Claim 13 (previously presented): The method of claim 12 wherein the at least one hole of the stand-off is larger in diameter than the at least one hole of the substrate.

Claim 14 (previously presented): The method of claim 12 wherein the substrate comprises a plurality of holes to be filled and the stand-off comprises a plurality of holes wherein each hole to be filled of the substrate is aligned with a hole of the stand-off.

Claim 15 (previously presented): The method of claim 14, wherein the at least one hole of the stand-off extends only through the external copper layer of the stand-off.

Claim 16 (previously presented): The method of claim 12 wherein a first set of pins aligns the stand-off to the tooling plate and a second set of pins aligns the substrate to the stand-off.

Claim 17 (previously presented): The method of claim 16 wherein the stand-off rests on but is not bonded to tooling-plate other than by the pins aligning the stand-off and the tooling plate, and the substrate rests on but is not bonded to the stand-off other than by the pins aligning the stand-off and the substrate.

Claim 18 (previously presented): The method of claim 12 wherein at least one hole of the substrate is filled with a fill material that extends partially into a hole of the stand-off without contacting the stand-off.

Claim 19 (previously presented): An etched hole-fill stand-off to support a printed wiring board, comprising:

a non-etched copper layer;

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an etched copper layer having a plurality of etchings, wherein at least one etching of the plurality of etchings is aligned with a hole of the printed wiring board, and

a dielectric layer laminated between the non-etched copper layer and the etched copper layer.

Claim 20 (previously presented): The etched hole-fill stand-off of claim 19 wherein the at least one etching is larger in than the hole of the printed wiring board.

Claim 21 (previously presented): The etched hole-fill stand-off of claim 19 wherein the printed wiring board comprises a plurality of holes to be filled, wherein each hole to be filled of the printed wiring board is aligned with an etching of the plurality of etchings of the stand-off.

Claim 22 (previously presented): The etched hole-fill stand-off of claim 21, wherein the at least one hole of the stand-off extends only through the external copper layer of the stand-off.

Claim 23 (previously presented): The etched hole-fill stand-off of claim 19 wherein a first set of pins aligns the stand-off to the tooling plate and a second set of pins aligns the printed wiring board to the stand-off.

Claim 24 (previously presented): The etched hole-fill stand-off of claim 22 wherein the stand-off rests on but is not bonded to the tooling-plate other than by the pins aligning the stand-off and the tooling plate, and the printed wiring board rests on but is not bonded to the stand-off other than by the pins aligning the stand-off and the printed wiring board.

Claim 25 (previously presented): The etched hole-fill stand-off of claim 19 wherein at least one hole of the printed wiring board is filled with a fill material that extends partially into an etching of the stand-off without contacting the stand-off.